इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 8593-3 (1984): Recommendations for centralized lubrication as applied to plant and machinery, Part 3: Aerosol lubrication [PGD 19: Lubricating Equipments]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

UDC 621-722-404·8

IS : 8593 (Part 3) - 1984

(Reaffirmed 2001)

Indian Standard

RECOMMENDATIONS FOR CENTRALIZED LUBRICATION AS APPLIED TO PLANT AND MACHINERY

PART 3 AEROSOL LUBRICATION

1. Scope — Lays down the recommendations for centralized aerosol lubrication system for plant and machinery with respect to installation practice, system pipe work and ancillary equipment for light and heavy industries.

2. Terminology

2.1 *Aerosol* — A system of colloidal particles dispersed in a gas.

2.2 *Aerosol Lubrication Systems (Continuous Proportionate)* — An aerosol consisting of minute particles of lubricating oil suspended in compressed air or gas is generated at a central point and piped to the points of application where the aerosol is converted back to useful oil through specially designed restrictors.

3. Classification of Aerosol Lubrication System

3.1 This system is a 'total loss system' in which none of the lubricant fed to the lubrication point is returned to the reservoir.

3.1.1 Under the 'total loss system', the aerosol lubrication system is a 'continuous proportionate' system.

4. Reservoirs

4.1 The reservoirs used in aerosol lubrication system are generally smaller than those used in other centralized lubrication systems. The size of the reservoir is primarily dependent on the desired interval between replenishment of oil in the reservoir.

4.2 When lubricating oils of higher viscosity are to be used in the system, oil and air heaters may be used to assist conversion of oil into aerosol. When electric immersion heaters are used inside the reservoirs, care shall be taken to ensure a low watt density of the heater element to minimise the possibility of decomposing the oil or causing it to oxidize on the heater elements. Adequate safety precautions shall be adopted to prevent energising of the electric heater when it is only partially submerged in oil. The heater shall be provided with a thermostat to cut-off power when desired temperature is attained. The oil temperature should not be allowed to exceed 55°C and a maximum heater loading of less than 8 kW/m^2 is recommended in order to avoid overheating and consequent oxidation of the lubricating oil. Oil temperature indicators shall be provided when oil heaters are used in the system.

4.3 Accessories like oil filler plugs, drain plugs and oil level indicators shall be provided on the reservoirs.

5. Filtration

5.1 The lubricating oil used in the aerosol system should be filled in the reservoirs using filling devices fitted with fine strainers to trap dirt and other solid contaminants in the oil. Wherever possible, such strainers should be provided on the oil filling devices of the reservoirs.

5.2 The compressed air used for the aerosol system should be free from solid contaminants such as dirt, dust, etc, as well as from the condensed moisture. A suitable water separator-cum-filter of adequate capacity and design should be fitted on the supply air line prior to its connections to the lubricators.

Lubricating Equipment Sectional Committee, EDC 63; Panel for Aerosol Lubrication System, EDC 63/P-7 [Ref : Doc : EDC 63 (3625)]

Adopted 25 June 1984

© September 1984, ISI

Gr 2

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

6. Monitoring

6.1 Monitors of the visual type such as pressure gauges, thermometers and level indicators or more complex automatic devices such as pressure switches, contact gauges and level controls may be used with the aerosol system.

7. Warning

7.1 Methods of warning of system failure include audible alarms and visual alarms such as lights. Initiation of warning may be by level switches, pressure switches, etc.

7.2 A specific plant requirement may be to stop the machine after a specified interval of time after system failure.

8. Pipes, Tubes, Hoses and Fittings

8.1 As the aerosol system is essentially a low pressure system, the stringent requirements of pressure rating, strength, etc, of the pipes, tubes, hoses and fittings of the other centralized lubrication systems need not be applicable to this system.

8.2 Only specific mention that need be made should be the requirement of having smooth bores free from corrugations, welding beads, etc, on the inside surface of the pipes, tubes, hoses and fittings used on the system. The fittings used should not cause any abnormal restriction to the flow of the aerosol in the system. The pipe work should be sized to ensure that the transmission velocity of the aerosol is below 6 m/s.

9. Cleanliness of Pipe

9.1 Cleanliness of pipes is especially vital in the case of aerosol system on account of the low pressure of transmission of aerosol in the system and the small sizes of the bores of the restrictors used for conversion of the aerosol into liquid oil at the point of use. All open ends should be capped or sealed and should remain so during storage, transit and assembly. When cutting, end threading pipe or tube it should be ensured that all swarf is removed and use of excessive amounts of sealing compounds at threaded or flanged joints is avoided.

10. Compatibility of Equipment with Lubricants

10.1 It is recognized that the function of a lubricant is to lubricate the bearing surfaces of the plant concerned and that this is the prime consideration in lubricant selection. However, in the aerosol lubrication system, the suitability of the lubricant for use in the aerosol lubricator equipment will also need to be taken into account.

10.2 For best lubricator performance, select the lightest oil (lowest viscosity) that will give satisfactory lubrication. Only oils that are recommended by reliable suppliers should be used in the aerosol systems. Use of supplementary additives concentrates, volatile solvents as diluents, and solid lubricants shall be avoided. In aerosol systems with oil and/or air heaters, lubricant stability characteristics are of critical importance. The lubricant shall be thermally stable and resist oxidation when it is subjected to continuous recycling in the generator. The success of the aerosol system depends on a change of physical state of the lubricant from liquid to finally divided droplets and back again into liquid. The selection criteria of a suitable lubricant shall specifically include this aspect of the system.

11. Installation Methods and Safety

11.1 In the case of aerosol systems, all main pipe work should be installed so that it slopes back towards the storage tank and means should be provided to prevent entrapment of any residual oil or to allow its draining off from down loops (*see* Fig. 1).

11.2 Distribution plubbing should have certain minimum sizes based on the quantum of aerosol being conveyed through the particular section. The manufacturer of the equipment shall recommend the minimum sizes of the piping system to be employed. All pipings should be smooth and clean. Unnecessary bends, fittings, etc, should be avoided to eliminate turbulence in the transmission system. The system shall be flushed clean during installation to eliminate scale and dirt that could plug small restrictor bores. (Other requirements of the centralized lubrication systems are generally applicable to aerosol systems also.)

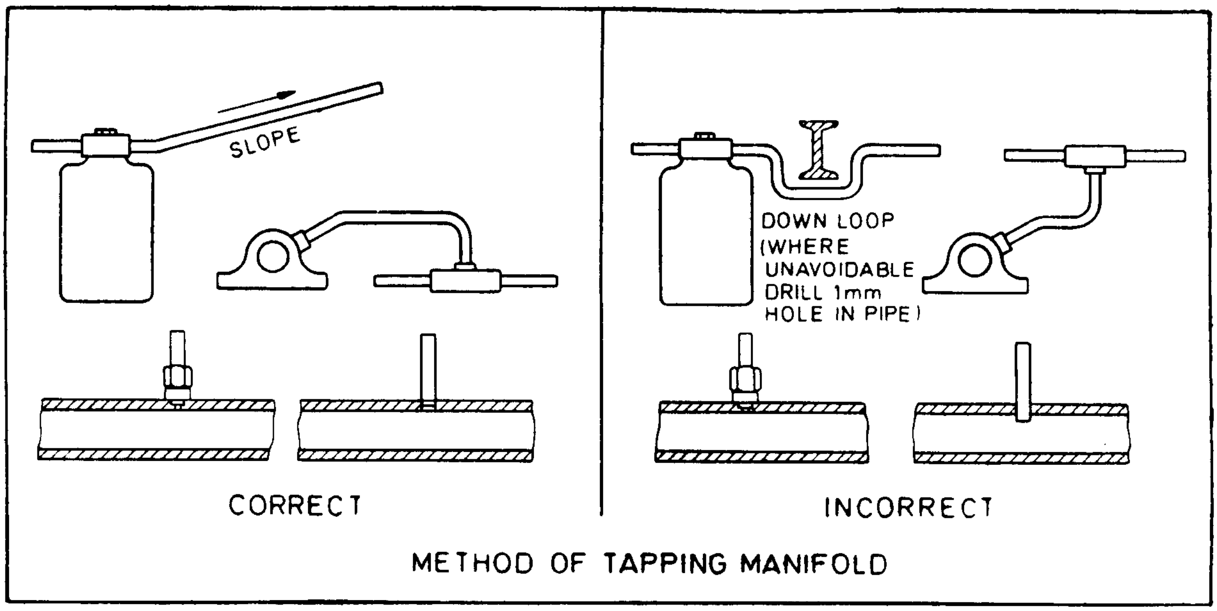
SLOPE
DOWN LOOP (WHERE UNAVOIDABLE DRILL 1mm HOLE IN PIPE)
CORRECT
INCORRECT
METHOD OF TAPPING MANIFOLD

FIG. 1 INSTALLATION METHODS FOR AEROSOL SYSTEMS

11.3 *Systems Using Pressurized Reservoirs*

11.3.1 Lubricating system reservoirs shall have the maximum design working pressure marked on them and should be provided with the following:

a) Pressure gauge with dial to indicate pressure at which the system is operating;

b) Safety valve with oil impervious seating and seal to prevent the safe working pressure of the reservoir being exceeded unless is constructed safely to withstand the maximum pressure obtainable from the compression;

c) Means of venting residual air from the reservoir prior to operating the filler cap; and

d) A distinguishing mark which should be easily visible.

11.3.2 Attention is drawn to the fact that statutory requirements may apply for air receivers. If these apply to any vessel in factory premises in which oil is stored and from which it is forced by compressed air, they should be complied with.

12. Commissioning Aerosol Systems

12.1 Before attempting to start up the system for the first time, check to ensure that procedures have been properly carried out in accordance with the supplier's instructions. This check should include verification of the following:

a) Restrictors and reclassifiers are correctly positioned;

b) Manifold pipework is internally clean, of the correct size and correctly positioned without downloops;

c) All pipes are connected and tight;

d) Facilities are available for checking manifold pressure including a gauge connection point at the remote end of the system;

e) Adequate compressed air supply is available;

f) The lubrication system can be run without having to start the machine;

g) All gears, slides end bearing surfaces have been cleaned of any protective coating and pre-lubricated with the se ected grade of lubricant; and

h) A compressed air filter with a 25 μm element is fitted immediately ahead of the air regulator.

12.2 Suppliers' recommendations and adjustment procedures shall be adhered to during initial start-up of an aerosol lubrication system.

12.3 The reservoir should be filled with clean oil of the correct viscosity. Oil should be selected in accordance with the recommendations for the lubricant supplier and approval by the equipment supplier to ensure that the lubricant can be successfully atomized, and that it will not cause excess mist.

12.4 It is important not to overfill. The oil level should always be visible in the sight glass on the lubricator reservoir, as an air space is required to ensure proper operation of the lubricator and generation of mist.

12.5 Inability to obtain the correct manifold pressures would indicate in the case of insufficient pressure one or more of the following causes:

a) Lubricator of insufficient lubrication unit capacity;
b) Disconnected or open-ended pipework; and
c) Fractured pipework.

12.6 If manifold pressure is excessive this would indicate one or more of the following causes:

a) Lubricator of excessive lubrication unit capacity;
b) Manifold pipework of insufficient bore or crushed pipework;
c) Manifold or restrictor blockage; and
d) Wrong restrictor fitted of insufficient capacity.

13. Maintenance — To ensure the continued effective operation of aerosol lubrication systems, it is essential that the equipment be maintained correctly. The user should consult the supplier to discuss the periodic maintenance requirements of the particular installations.

EXPLANATORY NOTE

This standard on centralized lubrication is being issued in the following parts based on the type of lubrication used:

Part 1 Oil lubrication
Part 2 Grease lubrication
Part 3 Aerosol lubrication

This standard is only a general guide and does not lay down the specific design requirements. It is, therefore, imperative that while designing new system consultation takes place between user, equipment designer and lubricant supplier.

In preparing this specification considerable assistance has been derived from BS 4807-1972 'Recommendations for centralized lubrication as applied to plant and machinery' issued by the British Standards Institution.

Printed at New India Printing Press, Khurja, India